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**Rock Paintings**

**Writer:** Jennifer Rogers, Science Teacher

**Grade Level:** 6th

**Related Big Picture Concepts:** Cycle, Environment, Investigation, Observation, Variation

**Subject Areas:** Science, Visual Arts

**Essential Question**: What are the three types of rocks, and how do they vary in texture? How do artists show texture in painting?

**Abstract:** Students will learn the three types of rocks and the different characteristics of each. Students will make observations to compare rock textures and learn how texture can be used in art. Observation skills will be used to create a scale painting with texture of a rock sample.

**Duration:** 180 minutes

**Focus Works of Art:**



Franz Kline (American, 1910 - 1962)
***Orange Outline*, 1955**Oil on paperboard mounted on canvas
3ft 2in x 3ft 4in (96.5cm x 1m 1.6cm)

[www.artnc.org/node/439](http://www.artnc.org/node/439)

**North Carolina Standards Correlations:**

Science: 6.E.2.3

Visual Arts: 6.V.1.1, 6.V.2.2, 6.V.3.3.

**Student Learning Objectives:**

* Students will apply knowledge of rock characteristics to classify rocks as igneous, sedimentary, or metamorphic.
* Students will explore texture of various objects, including rocks, and use words to describe texture (including geology terms).
* Students will identify texture and scale in art.
* Students will incorporate texture and scale into an observational painting of a rock sample.

**Activities:**

1. Give each group a collection of rock samples. The collection should include several examples of each of the three types of rocks; igneous, metamorphic, and sedimentary (limestone, obsidian, granite, gneiss, sandstone, slate, diorite, etc.). Allow students to use a hand lens to observe each rock, making quantitative and qualitative observations. Students can find mass, length, width, color, texture, grain size, grain shape, luster, etc. Tell students to record their observations on the Rock Classification Handout.
2. After students have made several observations, allow them to use the Rock Dichotomous Key to classify each rock as igneous, sedimentary, or metamorphic.
3. Discuss classifying rocks with students. Ask students to work with a small group to brainstorm a list of observable characteristics that show how the types of rock are different. Make a class list and lead students to understand that geologists use mineral composition, color, and texture to determine the type of rock. Discuss how mineral composition and color are related (certain minerals have a specific color).
4. Discuss the word *texture*. Tell students that they will be exploring the texture of rocks including the size, shape, and arrangement of the grains in the rock. Allow students to use Internet resources to complete the Rock Classification Graphic Organizer. Students should learn that each type of rock has a specific texture (large grained, fine grained, glassy, foliated, nonfoliated).
5. Review each type of rock. Show students examples of igneous, sedimentary, and metamorphic rocks. Have students point out the differences in color and texture. To review further, show the *Types of Rocks* BrainPop video and allow students to take the interactive quiz.
6. Review the word *texture*. Ask students how the texture of a rock is determined. Discuss other ways that people describe the texture of objects. Questions include: *How do geologists find the texture of a rock? How is that similar/different to the way you would describe the texture of a common object? What words would you use to describe the texture of objects? What do you use to explore texture?*
7. Allow students to explore the texture of common objects with their hands and bodies (students can use tongue to explore the texture of licorice, put their feet in the sand, rub feathers against their skin, feel an ice cube, etc.). As students are exploring the texture of the objects, they should write down the words they are using to describe the textures. Review these words together.
8. As a class, discuss texture in art. Tell students how texture can be the feel of a sculpture or the look of a painting. Ask: *Why do you think artists use texture? What materials do you think artists can use to create texture on a painting? Sculpture?*
9. Project and discuss Franz Kline’s *Orange Outline*. Questions include: *What do you see in this image? What could this painting suggest as its subject?*
10. Ask students to take a closer look at the painting to observe the texture. Questions include: *What do you think the texture of this painting would be like? If you were able to run your hands over it, what would this painting feel like? How do you think Kline created this effect?*
11. Discuss how artists have a subject for their paintings. Ask: *What do you think the artist was painting? What is the subject?* Tell students how Kline often worked from small sketches to large paintings. Define the word *scale*. Use the “background information” [www.artnc.org/node/439](http://www.artnc.org/node/439)

for support.

1. Allow students to choose one rock from a collection of samples. Tell students they will be creating a scale drawing/painting of the texture of their rock sample. Discuss texture of rocks and how students can use paint to create texture on their painting.
2. Have students use a hand lens to pick out a small portion of the rock that can be used to show texture. Students will use this small spot and create a large-scale painting.
3. Allow students to begin painting, first choosing a main color and applying the first layer with a large brush.
4. Students should continue painting, applying more layers, colors, and textures to the painting. Students can also use sand, gesso, glitter, and sponges to create a texture to their painting.
5. During painting, remind students to compare their work to the original rock sample.
6. Once students have completed their work, ask them to write a reflection about the process using the Rock Painting Reflection Handout.

**Assessment:**

* Student observations and classifications of rock samples will demonstrate whether students correctly used the dichotomous key on the Rock Classification Handout.
* Group lists of rock characteristics and class discussion will demonstrate students’ understanding of how geologists classify rocks in different groups.
* The Rock Classification Graphic Organizer illustrates students’ understanding of how igneous, sedimentary, and metamorphic rocks differ in origin and texture.
* Class discussion about Franz Kline’s *Orange Outline* will assess students’ ability to use vocabulary to discuss art.
* The rock painting and reflection will demonstrate students’ ability to use observations to create a scale painting with texture (rubric).

**Resources:**

Vocabulary:

 igneous rock

metamorphic rock

sedimentary rock

texture

fine grain

coarse grain

foliated

nonfoliated

scale drawing

Materials:
numerous samples of igneous, sedimentary, and metamorphic rocks
hand lenses
triple beam balances
metric rulers
various objects to use to explore texture (sand, feathers, ice, licorice, etc.)
cardstock to paint on
paint
gesso
sand
glitter
paintbrushes
scraping tools
sponges

Lesson Resources:
Rock Classification Handout
Rock Dichotomous Key
Rock Classification Graphic Organizer

Types of Rocks Internet Resources: <http://www.classzone.com/books/earth_science/terc/content/investigations/es0603/es0603page02.cfm?chapter_no=investigation>

<http://idahoptv.org/dialogue4kids/season3/rocks/facts.cfm>

<http://library.thinkquest.org/J0110482/>

<http://geology.com/rocks/metamorphic-rocks.shtml>

<http://geology.com/rocks/igneous-rocks.shtml>

<http://geology.com/rocks/sedimentary-rocks.shtml>

*Types of Rocks* BrainPop video:

<http://glencoe.mcgraw-hill.com/sites/dl/free/0078741831/164213/00044683.swf>

**Rock Painting Rubric**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Category** | **4** | **3** | **2** | **1** | **Score** |
| **Painting Skill** | Application of paint is planned and done in a logical, sequential manner. Texture is shown in the painting.  | Paint is applied in a careful, logical manner. Colors remain sharp with little texture. | Control is somewhat lacking. A few drips, ragged edges, and failure of certain areas of pattern/texture may be evident. | Student needs to work on controlling paint and planning paint application. Muddy colors, ragged edges, lack of texture, drips and/or blobs are evident throughout the painting.  |  |
| **Creativity** | Student has taken the technique being studied and applied in a way that is totally his/her own. The student's personality/voice comes through. | Student has taken the technique being studied and has used source materials as a starting place. The student's personality comes through in parts of the painting. | Student has copied some painting from the source material. There is little evidence of creativity, but the student has done the assignment. | Student has not made much attempt to meet the requirements of the assignment.  |  |
| **Planning and Explanation** | Students can describe, in detail, at any point during the painting process how they envision the final product and how they intend to reach their goal. Very focused and goal-oriented. | Students can somewhat describe how they envision the final product and can describe some of the steps they will use to reach the goal. Focused with some planning. | Students can describe how they envision the final product but find it difficult to describe how they will reach that goal. Has set a goal but lets things evolve in somewhat random manner. | Student has thought very little about the project. Is present but is not invested in the product.  |  |
| **Capturing a Style/Artist** | Paint is applied in a manner very consistent with the technique of creating texture. | Paint is applied in a manner that is reasonably consisted with the technique of creating texture. | An attempt has been made to apply paint in a manner that is consistent with the technique of creating texture. | No attempt has been made to apply paint in a manner that is consistent with the technique of creating texture. |  |
| **Knowledge of Geology** | Student can describe the texture and properties of the rock using at least 3 geologic terms. | Student can describe the texture and properties of the rock using at least 2 geologic terms. | Student can describe the texture and properties of the rock using 1 geologic term. | Student cannot use geologic terms to describe the rock.  |  |

**Rock Painting Reflection**

Reflect on your painting and the process you went through to create it. Answer the following questions in complete sentences.

1. Describe the texture of your rock sample (use 3 geologic terms).

2. What type of rock do you think your sample is? What observations lead you to believe this?

3. How is your painting similar to your rock sample?

4. How is your painting different from your rock sample?

5. What tools did you use to create texture in your painting? Explain the process you went through to make your painting show texture.

6. Why do you think careful observations are important in science?

7. How is observation a critical skill for art making and art analysis?

**Rock Classifications**

Question: How can we use characteristics of rocks to determine the rock type?

Materials: rock samples, triple beam balance, metric ruler, rock dichotomous key

Hypothesis: I think that the three different types of rocks will look similar/different because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Procedure:

1. Look at the rock samples on your desk.
2. Use the tools to make qualitative and quantitative observations. Fill the data into the chart.
3. Use the dichotomous key and your observations to determine what kind of rock each sample is.

Conclusion:

1. How are all three types of rocks similar? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. How are igneous rocks different from the other two types of rocks? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. What makes sedimentary rocks different from the other rocks you observed? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Types of Rocks Dichotomous Key**

Types of Rocks

**Rock Classification Graphic Organizer**

Fossils Present

Sedimentary Rock

Glassy

Igneous Rock

All sizes of crystals, randomly arranged

Igneous Rock

Crystals arranged in parallel bands or layers

Metamorphic Rock

Made of smaller pieces of sand and other rock cemented together

Sedimentary Rock

Crystals so small you can’t see them with eye. Very fine grained.

Igneous Rock

Rock breaks into hard layers

Metamorphic Rock

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of Rock** | **How is it formed?** | **Texture** | **Example of this type of rock** |
| **Igneous** | **Intrusive -**  | **Intrusive -**  | **Intrusive -**  |
| **Extrusive -**  | **Extrusive -**  | **Extrusive -**  |
| **Sedimentary** |  | **Clastic -**  | **Clastic -**  |
| **Organic -**  | **Organic -**  |
| **Chemical -**  | **Chemical -**  |
| **Metamorphic** |  | **Foliated -**  | **Foliated -**  |
| **Nonfoliated -**  | **Nonfoliated -**  |